

ANATOMY AND HISTOLOGY OF BILIARY SYSTEM

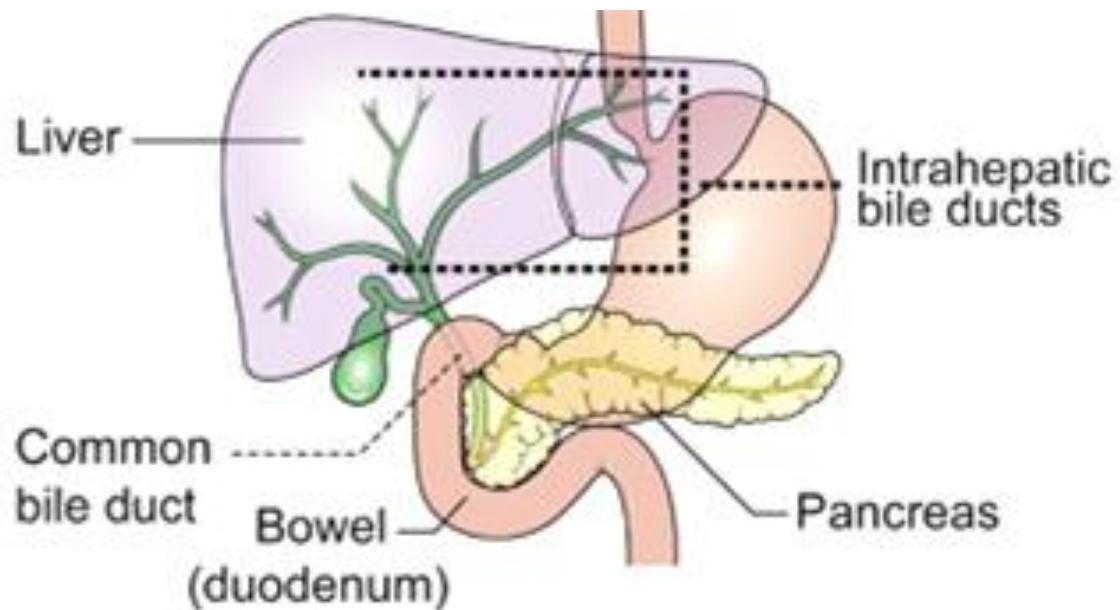
Dr.Sahar Hafeez
(Shafeez@pnu.edu.sa)

Learning Objectives

Students should be able to;

- Enlist the parts of intra-hepatic and extra-hepatic biliary tree
- Describe the gross features of gall bladder
- Describe the microscopic structure of gall bladder
- Describe the clinical significance of gall stones

- The biliary system is made up of a series of *intra-hepatic* and *extra-hepatic ducts* and a storage bag, the *gall bladder*.



Bile is constantly produced by the liver cells and flowing into the biliary system.

Intrahepatic biliary ducts

The basal faces of adjoining hepatocytes are welded together to form *canaliculi*, the first channel in the biliary system. **A bile canaliculus is not a duct**, but rather, the dilated intercellular space between adjacent hepatocytes.

Bile canaliculi



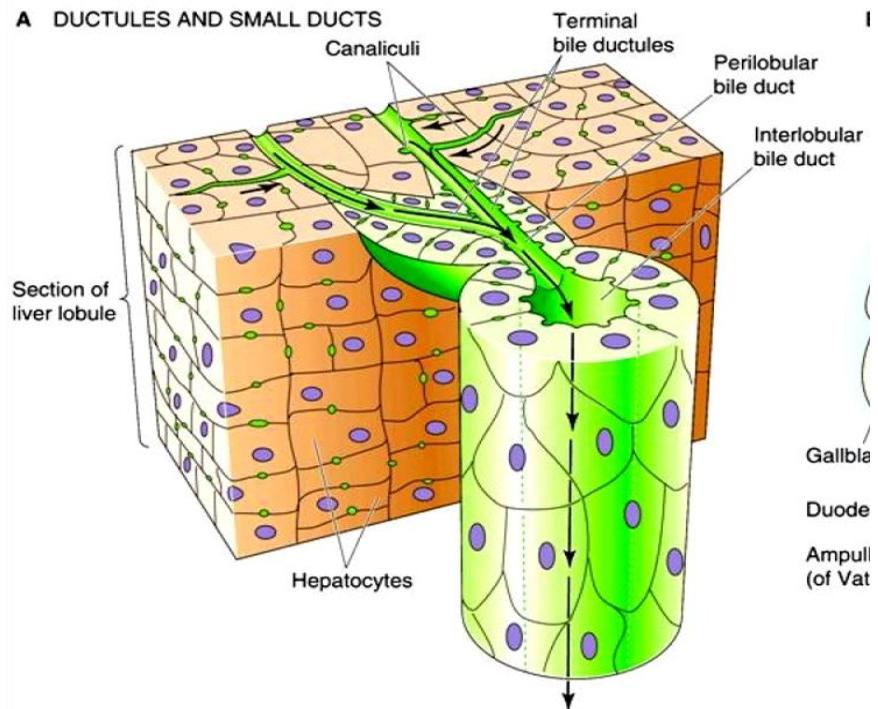
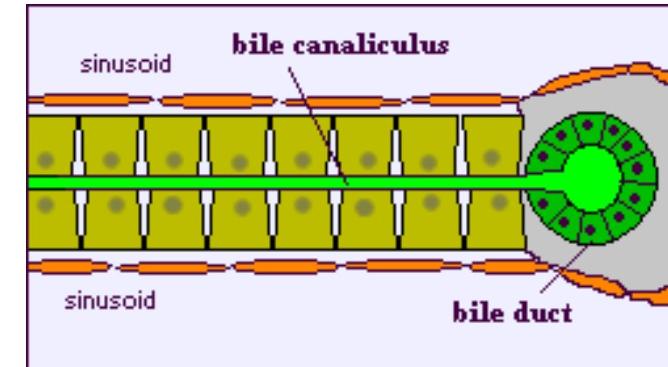
Intralobular Bile ductules



Inter lobular ducts



Right & Left Hepatic ducts



Extrahepatic biliary ducts

Right & Left Hepatic ducts

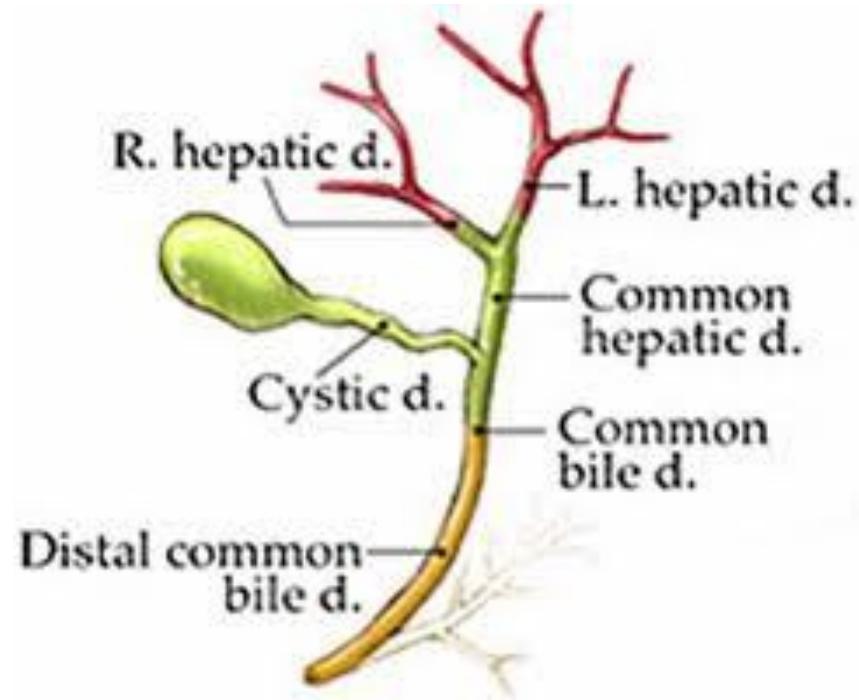


Common Hepatic duct

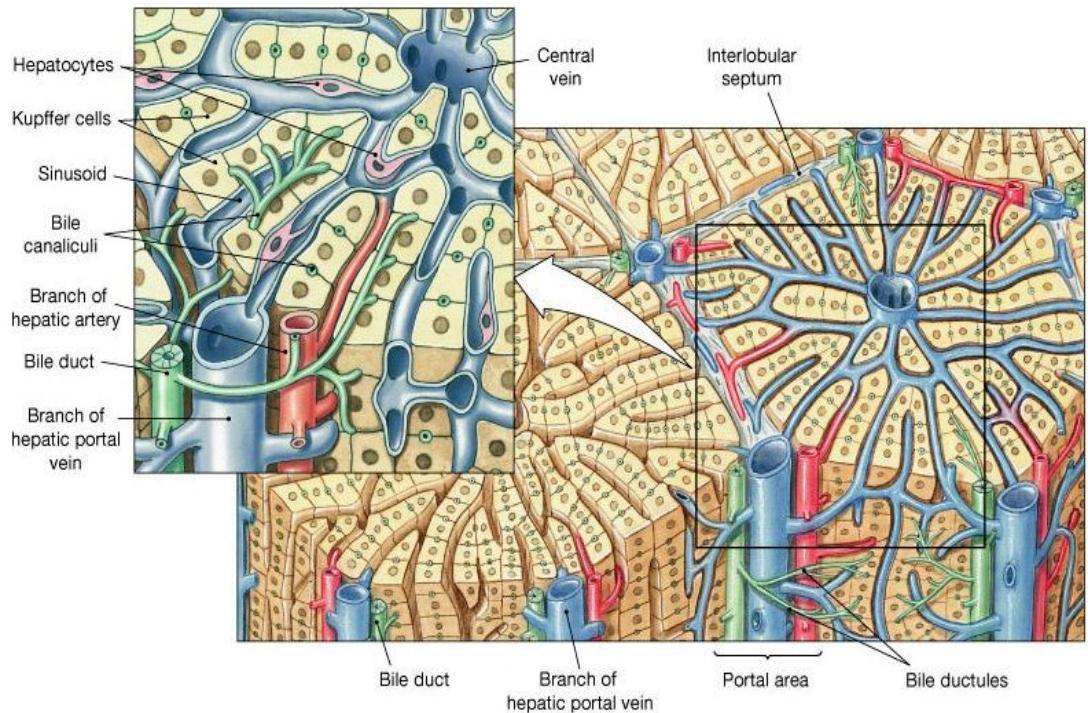
Cystic duct



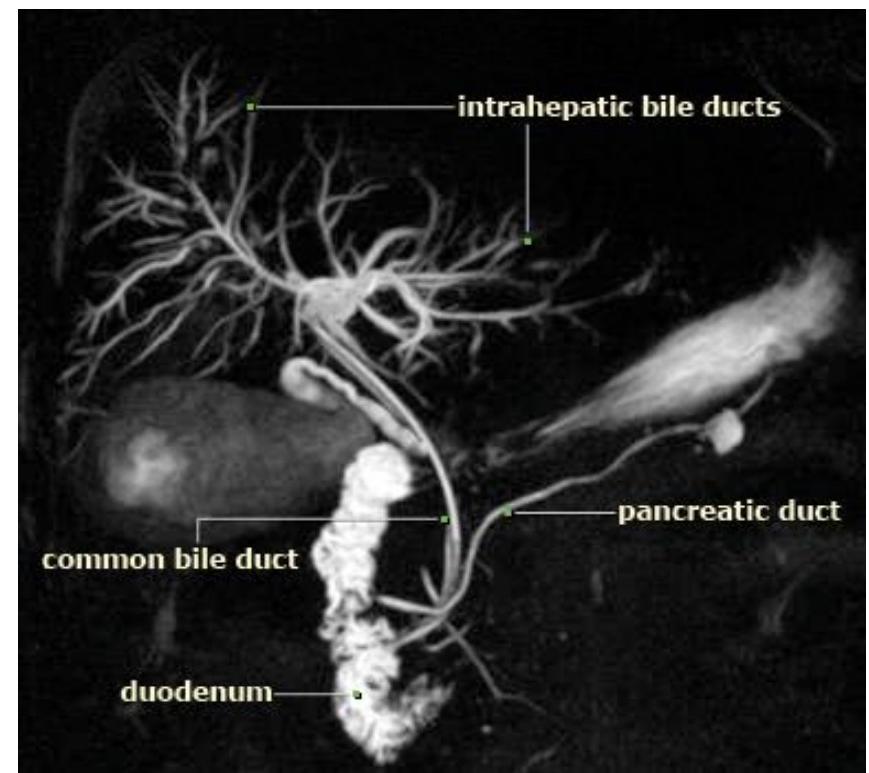
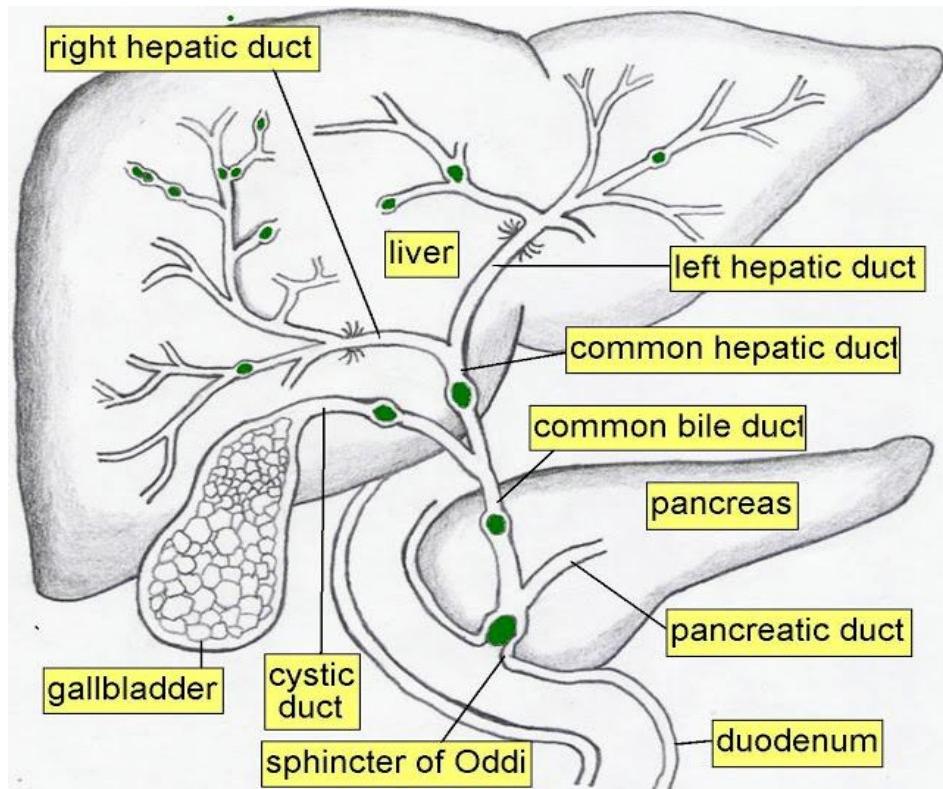
Common Bile duct



- Hepatocytes secrete bile into the canaliculi, and those secretions flow parallel to the sinusoids opposite the direction of flow of blood
- At the ends of the canaliculi, bile flows into bile ducts, which are true ducts lined with epithelial cells

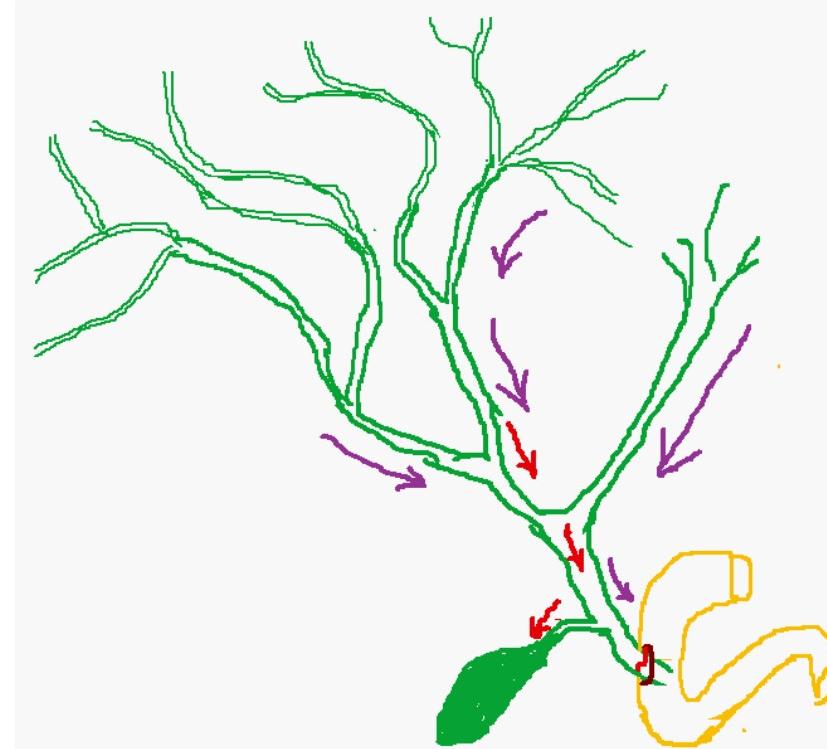


Architecture of Biliary tree



Flow of bile in the absence of a fatty meal

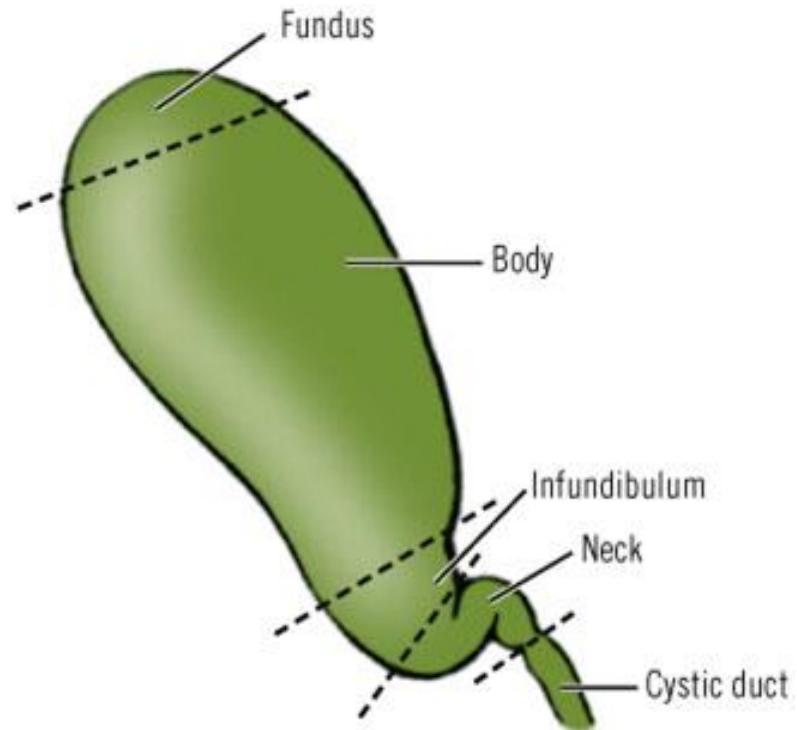
- In the absence of a fatty meal, the intestine doesn't require bile. So, the *sphincter of Oddi* will be closed. The bile flowing in the hepatic ducts will get directed towards the cystic duct and into the gall bladder for storage.



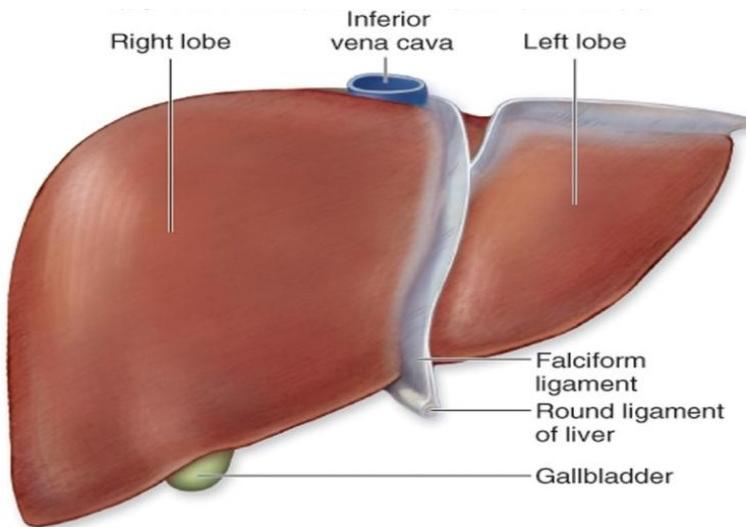
- (purple arrows indicating the normal pattern of flow of bile into the duodenum.
Red arrows indicating a diverted flow towards the gall bladder)

Anatomical structure of Gall bladder

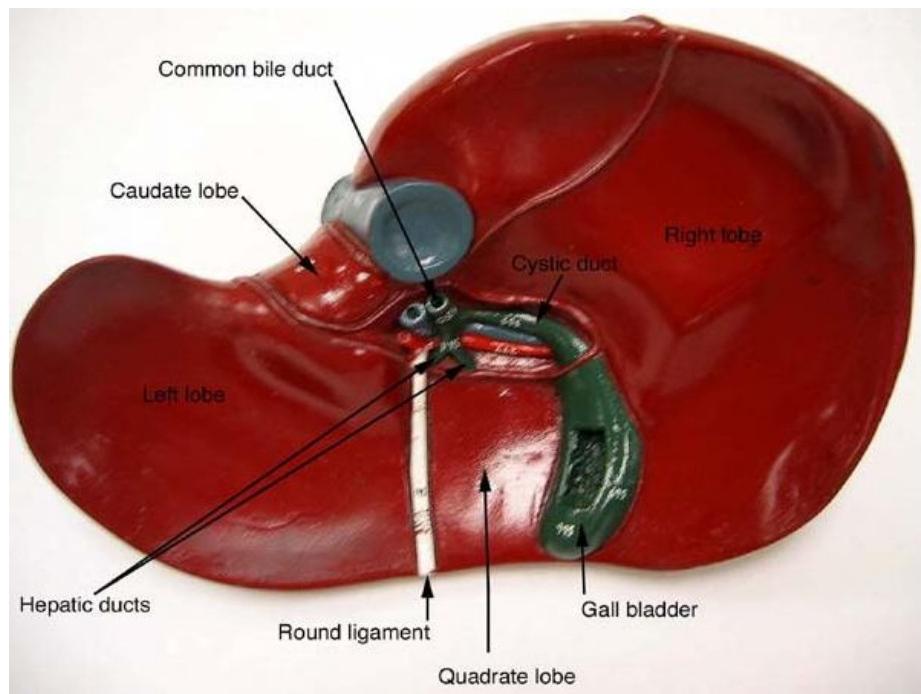
- A sac-like structure attached to the visceral surface of liver.
- Has a duct (cystic duct) that leads directly into the common bile duct.



Position of the gall bladder

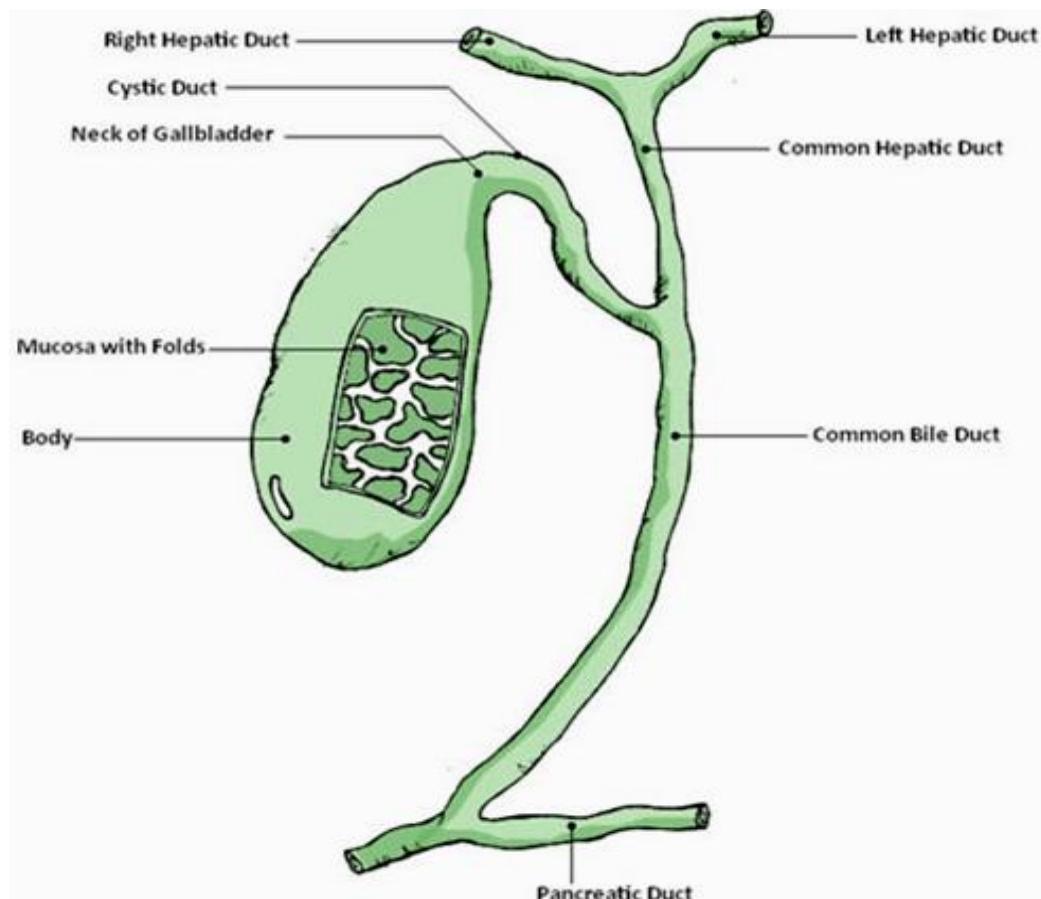


(a) Anterior view



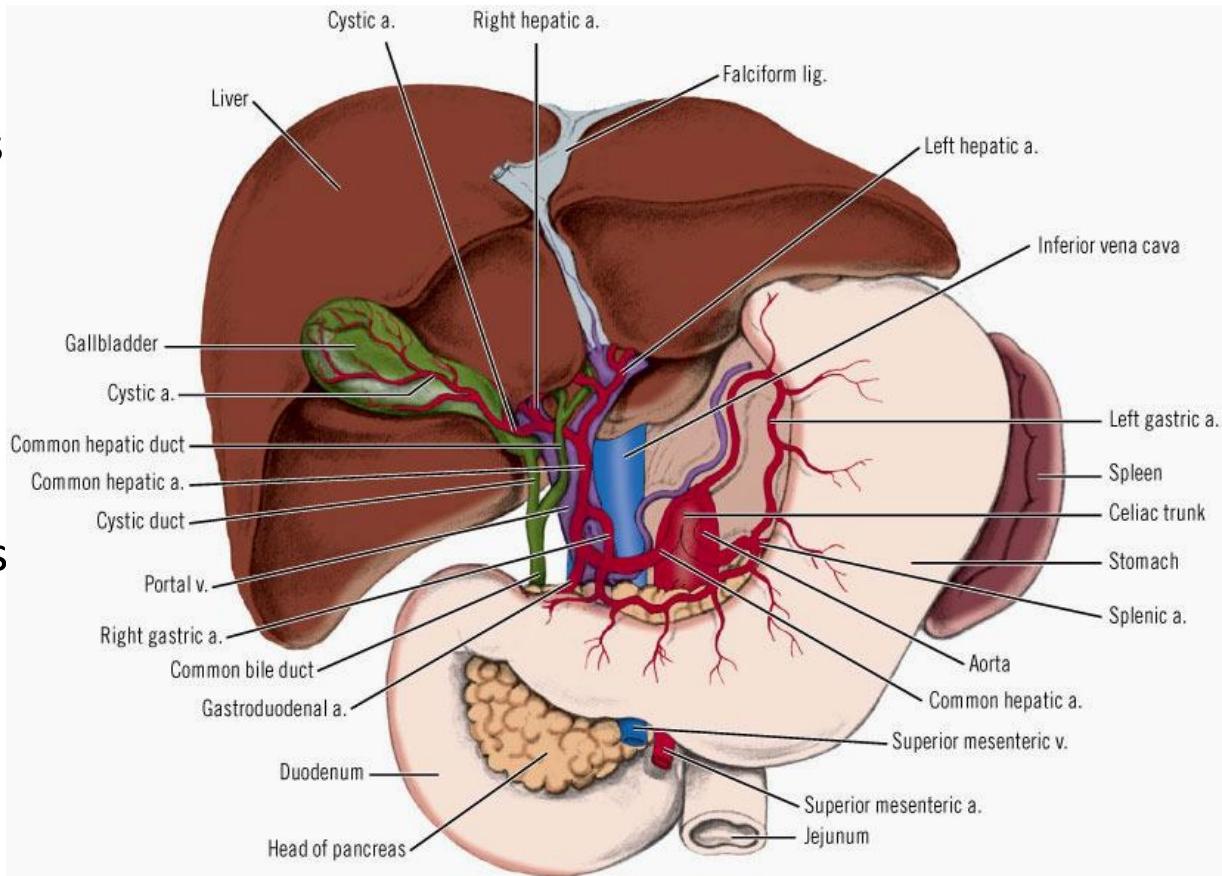
The Gall bladder

- During periods when bile is not flowing into the intestine, it is diverted into the gall bladder, where it is dehydrated and stored until needed.



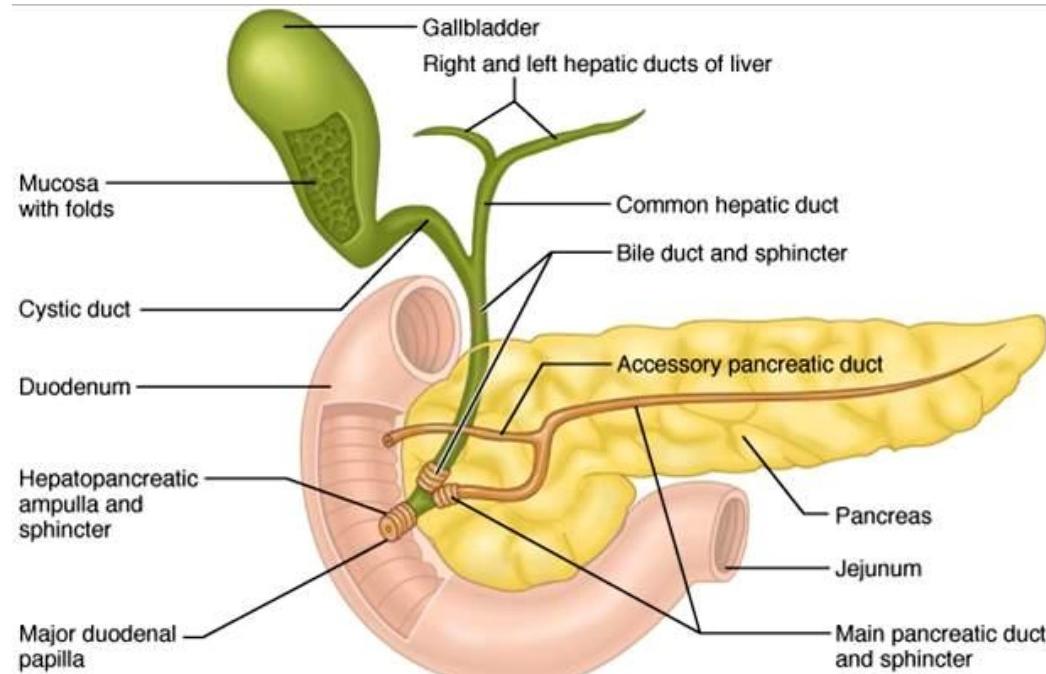
Blood supply of gall bladder & cystic duct

- **Cystic artery**, a branch of right Hepatic artery supplies both the gall bladder & cystic duct
- **Cystic vein** drains both the structures either directly into one of the hepatic veins or drains through the hepatic portal vein



Gallstones & Cholecystitis

- Stones/calculi can be found anywhere in the gall bladder, cystic duct, bile duct, or hepatic duct.
- Hepatopancreatic ampulla is the narrowest part of the biliary passage & is the commonest site for impaction of gallstones.
- This impaction may produce 'biliary colic' in the epigastric region.
- Causes inflammation of gall bladder/cholecystitis



Histology of Gall bladder

- The gallbladder is a distensible sac .
- In an undistended state, its mucosa is thrown into many folds.
- The lumen is lined with a high columnar epithelium.
- The connective tissue wall contains abundant elastic fibers and layers of smooth muscle which predominantly run obliquely

